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Lapierre *et al.* acknowledge the importance of systematic reviews in relation to trauma simulation as an educational process but believe that our systematic review has certain methodological limitations (Barleycorn & Lee, 2018). We will address their concerns below.

In terms of their comments on study selection, we respect their opinions; with the inclusion criteria, we provided a clear rationale for the years chosen with the advent of trauma networks in 2010 and the publication of the national trauma guidelines and this was why we omitted the literature from 2000 to 2009. The set timeframe purposively reflected the new trauma networks in England and the significant technological changes in simulation and changes in teaching, learning and evaluation techniques relating to simulation in the years since 2010. Of course, this contextualises the results and we may have had different results if we had included all years from 2000.

Relating to data extraction and synthesis, the aim of the paper was stated as examining high fidelity and team simulation and thus we believe we articulated this. In terms of the authors' point regarding stimulation with real patients in-situ versus simulation suite outcomes, our aim was to examine the educational process, and this was our focus.

The authors disagreed on the selection of papers chosen, however, we utilised the recommended methods for systematic review and clearly shown via the PRISMA diagram the papers chosen. Overall applying our inclusion and exclusion criteria, a total of 7 papers were identified. Some studies have found that time to diagnosis and treatment arising from improved non-technical trauma team skills from simulation, are a valid surrogate indicator of improved patient outcomes and we believe this is appropriate.

In terms of the analysis, there was clearly a heterogeneity amongst the papers identified and this resulted in the need to undertake a narrative commentary which disallowed meta-analysis. With critical appraisal and risk of bias, our methodology clearly outlines the chosen appraisal technique using the SIGN cohort checklist model examining study type and location, cohort and selection, intervention, primary endpoints, performance measures, evaluation tools, results and statistical analysis and this is also evident in Table 2. A pertinent point was that none of the studies were randomised, controlled and blinded indicating moderate to high bias and this was measured using the recognised Cochrane Risk of Bias Tool.

Ultimately, we agree about the conclusion on simulation on trauma. Simulation in trauma has a central role and remains an emergent field of study, characterised largely by observational studies,

which has known limitations in relation to degree of risk of bias and subjectivity (Fitzgerald et al, 2011). In summary, we believe that trauma units would benefit from increased trauma simulation training and accessibility to repeated simulation-based courses or workshops and we are clear that simulation has an important role to play. Lapierre *et al.* agree with this conclusion and the need to ensure that healthcare professionals develop their competencies and thus their performance in this area. As with a systematic review, it is temporal and independent replication is welcomed.

References:

Barleycorn, D., Lee, G.A., How effective is trauma simulation as an educational process for healthcare providers within the trauma networks? A systematic review, International Emergency Nursing (2018), doi: <https://doi.org/10.1016/j.ienj.2018.03.007>

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